CHAPTER FIFTEEN

LIGHTING

LIGHTING OF INTERCHANGES

ROADWAY POLICY ONE

POLICY STATEMENT:

The Lighting Section of the Design Services Unit will use the "Total Design Process" for lighting determinations at interchanges. Roadway lighting is beneficial in the reduction of nighttime accidents and in the identification of conflict points along the roadway by the motorists. Because it is not economically feasible to light every conflict point along the roadways of the state, it is the policy of the Department to construct and maintain lighting systems at interchanges and along continuous sections of fully controlled access roadways which meet specific criteria established by the American Association of State Highway Transportation officials (AASHTO), and the NCDOT Roadway Lighting Committee. The Department will allow the construction and maintenance of lighting systems by local governing bodies on state maintained roadways in accordance with the Policies and Procedures for Accommodating Utilities on Highway Rights of Way through the encroachment process.

BACKGROUND:

General update, 4/15/98
Roadway Lighting Policy, dated 2000
General Update, 4/16/01

PURPOSE:

The purpose of this policy is to establish procedures to be used in determining which interchanges should be lighted. It is felt that the present AASHTO guidelines for determination are too liberal. These guidelines are based primarily on traffic volumes and area classification. Using these guidelines either partial or complete lighting can be justified at the majority of our interchanges. It is evident that we can not afford to light all these interchanges and procedures are needed to determine where lighting will provide the most value for the least expenditure.

The best concept we have to date is the "Total Design Process." This is a process which develops the warrant for lighting by considering factors other than just traffic volumes. Through a numerical weighting and scoring process a particular interchange is assigned a

certain number of warrant points. Using these warrant points, the night average daily traffic and the annual cost of lighting (annual energy and annualized construction cost), a Priority Index number is developed for the interchange. This Priority Index number is then compared against a Base Priority Index number and if the base is exceeded, lighting will be further considered and probably included in the contract. The Base Priority Index number of 48 has been established as the minimum warrant for lighting. This is the Priority Index number of the High Point Road Interchange in Greensboro (I-40 at US 29-A and US 70-A). This is the interchange that was selected as the minimum warrant for lighting.

RESPONSIBILITY AND PROCEDURES:

It will be the responsibility of the Lighting and Electrical Engineer of the Design Services Unit to monitor updates of the Transportation Improvement Program to determine which interchanges might warrant lighting. Requests for lighting evaluations may also originate with the Roadway Project Engineer, Design Services Section Engineer, Planning and Development Branch, Right of Way Branch and Division Engineers.

After the preliminary field inspection has been completed, the Lighting and Electrical Engineer will request information required to evaluate specific interchanges and continuous roadway sections from the Roadway Project Engineer or the Design Services Section Engineer. The Lighting and Electrical Engineer will request information relative to geometrics, operational features, environmental aspects, and accident data.

It will be the responsibility of the Lighting and Electrical Engineer in the Design Services Unit to apply the Total Design Process to all interchanges and continuous sections of fully controlled access roadways that may warrant lighting. The Total Design Process generates a priority index based on a numerical weighting and scoring process. The Total Design Process incorporates roadway geometrics, nighttime average daily traffic and the annual cost of providing lighting to develop the Priority Index for an interchange or continuous section of roadway. If the Priority Index meets or exceeds the base priority index established by the Roadway Lighting Committee, the Lighting and Electrical Engineer will submit a request to the committee to include lighting in the roadway contract.

It will be the responsibility of the Roadway Lighting Committee to establish the Base Priority Index and to make the final decision concerning the inclusion of roadway lighting in the roadway contract. The committee membership shall include the Lighting and Electrical Engineer in the Design Services Unit, the State Design Services Engineer, the Special Design Engineering Manager in the Design Services Unit, the State Highway Design Engineer, the Deputy Highway Administrator for Preconstruction, the Director of Planning and Programming, the Deputy Chief Engineer for Construction and Maintenance, and the Traffic Operations and Safety Engineer in the Federal Highway Administration.

The committee will review the Base Priority Index at least once every five years. The committee may adjust the Base Priority Index depending on past and projected future transportation funding needs. The Lighting and Electrical Engineer will utilize the most current Base Priority Index to develop requests for the inclusion of lighting in roadway contracts.

The committee will review the reports prepared by the Lighting and Electrical Engineer and will decide if lighting will be included in the roadway project. The Chairman of the committee will officially notify the Lighting and Electrical Engineer in writing to proceed with lighting system design.

The Roadway Lighting Committee will also consider requests by local governments to include lighting in roadway projects involving fully controlled access facilities which have a priority index lower than the Base Priority Index or involving non-controlled access facilities. The Committee may approve the inclusion of lighting in such projects contingent upon the local government entering into a formal agreement to reimburse the Department for the total cost of designing and constructing the lighting system. The local government must also agree to maintain the lighting system in a manner acceptable to the Department.

The Department will also consider allowing the construction and maintenance of lighting systems by local governments on existing highways through the encroachment process in accordance with the Policies and Procedures for Accommodating Utilities on Highway Rights-of Way.

NOTE:
See Part Two, Chapter 15 in the Design Manual for procedures to follow in developing lighting plans.